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A GENERATION OF SURGERY

OUR warfare is world wide and unceasing, our fighting line deploys on every meridian and in every latitude, our columns keep step with the procession of the years. But it is not a monotonous march. Persons and events rise to prominence, there are famous camping grounds, there are weary sieges, there are trying defeats, there are glorious victories.

The publication a few weeks ago of the collected writings of Lord Lister, marks, to my mind, an epoch in the history of surgery. These volumes owe their origin to the desire of his followers to signalize in some fitting way the occasion of his eightieth birthday, but unavoidable circumstances have delayed their appearance for two years. Here we have traced for us by the master's own hand the development of a system which has revolutionized our art, and, more important still, we have the principles of physiology and pathology on which that system was based.

A consideration of this unique Fest-schrift and of the memorable period which it represents, suggests a review of the changes which have taken place in surgery during the past generation.

A generation is generally understood to mean a period of about thirty years, a period which covers the phase of maximum activity of most men, and I may also confess that a personal equation helps to determine my choice of this period, as it corresponds with that in which I have been permitted to practise my profession. I therefore look back to the year 1879. Many things have contributed to the great and beneficent changes in surgery during these thirty years.

The gradually accumulating mass of clinical experience, illuminated by light from many sciences; more minute and systematic autopsies; experimental pathology and operations on animals, have been of immense service, but nothing has been so profound and far-reaching an influence as the adoption of the principles and methods introduced by Lister; indeed, without these principles and methods, experimental pathology and surgery could scarcely have an existence. Our predecessors who were retiring from practice thirty years ago had good

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reason to be pleased with the work of their generation, famous for the introduction of anæsthesia. But few of them knew that they were on the threshold of an even greater advance in the service of humanity, in the development of antiseptic surgery.

First, then, because homage must be done to the master-mind which during a life time has stamped a new character on surgery, I would consider the view taken of Lister and his methods a generation ago. For over ten years Lister had been the solitary herald of a new day, but the dawn came very slowly. I think that the year 1879 was, in some respects, a momentous year for him. There were many, no doubt, who had been impressed and convinced by the arguments and the results of Lister; torches had been lit at the shrine in Edinburgh, and were shining here and there like good deeds in a naughty world. In Denmark, Germany, and America there were enthusiastic disciples, but the bulk of the profession in England, and, notably, most of the leaders in surgery, were sceptical, if not hostile. The climax came when Mr. Savory, of St. Bartholomew's Hospital, in the address on surgery at the meeting of the British Medical Association in Cork, in 1879, a master of vigorous rhetoric, and fortified by excellent statistics of the practice of his famous hospital, undertook to expose the pretensions of the new surgery and to demolish its foundations.

At a discussion in Paris in the same year one of the leading surgeons poured the vials of his scorn on Lister's methods, and with a touch of Chauvinism protested against the introduction of these "foreign methods" into France, methods which he characterized as a "veritable epidemic of antiseptics." But the change was at hand. Mr. Savory's elaborate attack may be regarded as the last serious attempt to discredit Lister's system. There was a memorable debate in London in the autumn of 1879 on antiseptic surgery, in which it was evident that the best thinkers, the most scientific surgeons, were on Lister's side. And the International Medical Congress in Amsterdam in that year set its stamp of approval on the hero and his work in the remarkable enthusiasm with which it greeted him, an ovation unparalleled in the annals of science, when the vast assemblage rose to its feet cheering tumultuously. There must have been some solace for the anxieties and discouragements of the long fight with "custom, prejudice, disease," when the president, the venerable Donders, took his hand, saying, "It is not only our admiration we offer you, it is our gratitude, and that of the nations to which we belong." This was the judgement of international surgery thirty years ago, and it has echoed and re-echoed round the world.

Those of us who can look back on surgery for thirty or forty years see vast changes. We scarcely understand how work was done in the old hospitals, in days when there were no electric lights, no telephones, no elevators. The equipment of a modern operating room would be a revelation to the great operators of the past. The wonderful discovery of Röntgen, too, has made diagnosis and treatment certain in cases which, a generation ago, would have been doubtful. A large part of the equipment of a modern hospital consists of apparatus for antiseptic treatment, not thought of in hospital construction thirty years ago.

The methods of securing an aseptic condition in wounds, and the dressings used, have been subject to many changes during the past thirty years. At that time only a very small number of surgeons considered this question at all, a question which soon came to stand first in importance. This is not the occasion for a discussion of the various methods of antiseptic surgery. I use the term antiseptic designedly, for we cannot have an aseptic wound without the use of antiseptic methods. The carbolic spray, which to many careless thinkers of the last generation was the essential element in Lister's method, has long ago been given up, but when I find his antiseptic methods characterized, as I did a few days ago in reading an article on the treatment of wounds, as "crude," I feel that a better term might have been used. There was nothing crude or ill-considered in what Lister did. His methods, including the spray, were firmly based on the scientific knowledge of that day, and were carried out with all the precision of exact science as well as the simplicity of the highest art. And no antiseptic has yet been devised superior to carbolic acid for all the purposes of the surgeon. It can be used to disinfect the hands, the field of operation, the dressings, and the instruments. It has its disadvantages, but its substitutes have more. One of its great advantages is its power of penetrating fatty substances, so that a single, thorough washing with a solution of one part of carbolic acid in twenty of water is as efficacious as the repeated applications of soap, ether, alcohol, and bichloride of mercury, so frequently used.

But, whatever methods may be employed, there is a vast difference from the procedure common thirty years ago. I saw a young man come to the out-patient department of a London hospital in 1878 with a large periosteal abscess over the mastoid. He had the appearance of having come directly from his work, unkempt and grimy. The surgeon, unperceived by the patient, took a bistoury out of his waistcoat pocket, a bistoury made like an ordinary clasp knife, opened it, and without more ado, plunged it into the abscess, and while the hapless youth hopped about in pain and surprise, directed him to go home and poultice it. And I saw worse things than this.

In another detail a great change has taken place, and that is in the more thorough hæmostasis practised in operations. Thirty years ago two or three pairs of artery forceps were considered amply sufficient for the operation of removal of the breast, where three or four dozen are required to-day.

There is no doubt that Lister's antiseptic method required more time and care than many surgeons seemed willing to give, but surely life and limb were worth it, if the results were better. Some men exaggerated the difficulties of antiseptic surgery, and one leading teacher characterized the difficulties as insurmountable. Yet, while he spoke, Carl Reyher, a young German surgeon serving with the Russian army in the Caucasus, who had surmounted the insurmountable by a few weeks study in Edinburgh, was employing Lister's methods on the battlefield with the audacity of youth and the confidence of science, and with a success which had never before been seen; the severest compound fractures, and even knee joints perforated by rifle bullets were dressed antiseptically and healed. The fact was that a new world was opening before us and not only were the ordinary operations of surgery made more successful, but surgery was extending in directions that had hitherto seemed impossible.

Mr. Savory and his friends asked for statistics and at first sight it seemed a reasonable demand. But if statistics are to be compared they must deal with similar materials. The operations of Savory and of Lister were in different categories. How many surgeons were there in 1879 who would open a psoas abscess, or open a healthy knee joint to remove a displaced cartilage or to wire a fractured patella? Savory and Spence were justly proud of their results in amputation. Lister might be prouder, for he had few to show. Shattered limbs, which, according to all the canons of surgery as it was thirty years ago, would have been material for ingenious operations by the house surgeon and his myrmidons, were stoutly supporting their owners, or wielding the hammer, steering the boat, guiding the plough, and earning the "bairnies' bread." There is no comparison between the most artistic stump and a serviceable limb.

Surgery had made great strides, and was proud of the appellation conservative, but even those who followed Lister scarcely dared to dream of the life-and limb-saving potentialities of surgery as it is to-day. Lister was indeed voyaging alone through strange new seas of thought and action. The exploration of joints, the suture of blood vessels, the open treatment, by wiring, of simple fractures in special cases, the resection and anastomosis of bowel for gangrene in strangulated hernia, were looked on as daring, and by some as unwarrantable, experiments, but such operations are a large part of the surgery of to-day.

The reproach and tragedy of surgery in those days was the uncertainty which characterized the results of operative treatment. Mere operative skill, as seen in amputations, excisions, and the ligature of the larger arteries, was probably never of a higher order than in the days of Syme and Nelaton, and yet results were unexpectedly disappointing. It was Lister who showed that the inconstancy of results, the disappointing failures, were due to the maleficent action of germs. It was he who cancelled suppuration as a factor in surgery. Our fathers looked with placid satisfaction on suppurating wounds and discoursed pleasantly of "laudable pus." How far removed from the chagrin, mortification, and disquietude of mind of the surgeon of to-day who discovers suppuration in any wound he may have made!

These microbic diseases were responsible for the great majority of the fatalities in surgery. They appeared and disappeared with perplexing uncertainty, and they were uncontrollable. A fearful example was the case of the Munich hospital in the early seventies, when eighty per cent. of all cases were attacked. Think of it! Eighty per cent. of all wounds, operative as well as accidental, affected with blood poisoning in the form of erysipelas, pyæmia, or hospital gangrene. The mortality was appalling; every amputation died; the hospital was a pest-house; they were about to close it or pull it down. Then Lister's methods were introduced, and with no other change whatsoever, the black record came to an end. It was as if the Angel of Mercy had spread her white wings over the place and fanned that sickly air, and ancient forms of foul disease had fled forever. No wonder that Nussbaum, heartbroken with the terrible fate of his patients, and perhaps unconsciously comparing these triumphs of peace with the fierce struggle for nationhood through which his country had just passed, "felt moved as with the solemn joy of a great victory." It was a great victory. It was Lister's victory. He conquered wound-infection and made surgery "sweet with certainties."

The generation which saw and shared in the victory is passing away and the new generation knows little of the struggle. But in the remarkable volumes to which I have referred they may find the principles which made the victory possible.

ADDENDUM

These statistical diagrams, drawn to scale, illustrate the extension of operative surgery during the past thirty years. They do not represent the actual operation-statistics of any hospital, but are compiled from papers and case reports published in the *Lancet*, Vol. I, for 1879 and 1909, and are an index to the general advance in surgery and to the change in the type of cases which interest surgeons and seem worthy of publication. Amputations, for example, have now become so uneventful that few cases seem of sufficient importance to record in the medical press. The noteworthy point is the vast increase in those operations which involve the opening of the peritoneal cavity: 1. Operations involving the pleural cavity,—ratio of advance, 1879-1909, 1:4. 2. Cranial and spinal surgery,—ratio, 3:10. 3. Operations involving the peritoneum,—ratio, 3:28. 4. Operations on bones and joints such as osteotomy, wiring simple or ununited fractures, exploring healthy joints for foreign bodies, etc.,—these only appear after 1879. 5. All other operations, such as amputations, excisions, removals of the breast, in which the ratio is unchanged.